Acquisition and T&E
M&S Practitioners Panel

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In Theory, there’s no difference between Theory and Practice

But, in Practice, there is

In Theory, there's no difference between M&S and T&E

But, in Practice, there is

In Theory, “seamless”, “plug-n-play” LVC interoperability can be achieved with Standards

But, in Practice, it depends

In Theory, models and simulations developed for one T&E program can be reused by other T&E programs

But, in Practice, it depends

This Briefing

….So much to say…so little time

- Could talk about **Lessons Learned** from Using M&S in T&E
- Could talk about the **Challenges** in Using M&S in T&E
- Could talk about **the Differences** in using M&S in T&E
- Could talk about our **Approach to Improve** using M&S in T&E
- Could talk about **Current Solutions** in using M&S in T&E
- Could talk about **New Initiatives** using M&S in T&E
- Could talk about **Opportunities** in using M&S in T&E

Most Important Point Up Front

- We're always open to **new ideas** and **new approaches**
- If you have a suggestion, recommendation, question, etc., please do ask…if not here at this Conference, then please:
  - **Attend a JMETC Users Group meeting**
  - **Attend a TENA AMT meeting**
  - **Talk to us at ITEA workshops, NDIA meetings, Test Week 2008**
  - **Submit a question at www.tena-sda.org**
  - **Send an e-mail to jmetc-feedback@jmetc.org**
    – OR –
    Send an e-mail to tena-feedback@tena-sda.org
    – OR –
    Drop me an e-mail directly at george.rumford@osd.mil
  - **Call me at 703-601-5233 or my assistant at 703-601-5202**

To Make DoD-wide Progress in Practicing the Art of Using M&S in T&E,
Your Engagement is Required (politeness is not)

What's the best solution to move dirt?

Recurring Elements of Successful M&S Solutions in T&E

- Requirements Documented
- Use Case Analysis
- Several Prototypes
- User Involvement / Participation

What’s more important?

- Finding bugs before integration
- Finding bugs during integration

What’s more important?

- Easy to Use
- Hard to Use Wrong

What’s more important?

- Flexibility (easy to evolve)
- Specificity (easy to integrate)

TRMC Investment Programs Overview

T&E/S&T

- Established in FY2002
- Develops technologies required to test future warfighting capabilities
- 6.3 RDT&E funds
- ~$65M / year
- 7 current focus areas
  - Directed Energy
  - Hypersonics
  - Netcentric Systems
  - Unmanned Systems
  - Non-intrusive Instruments
  - Spectrum Efficiencies
- 82 current projects

CTEIP

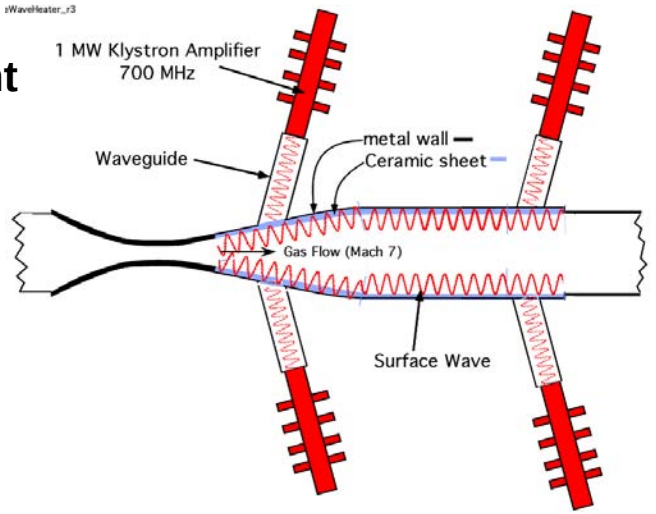
- Established in FY1991
- Develops or improves test capabilities that have multi-Service utility
- 6.4 RDT&E funds
- ~$140M / year
- 52 current projects
  - 27 projects developing core Joint capabilities
    - 2 projects improving interoperability test cap.
  - 9 projects improving threat representations used in testing
  - 16 projects addressing near-term OT shortfalls

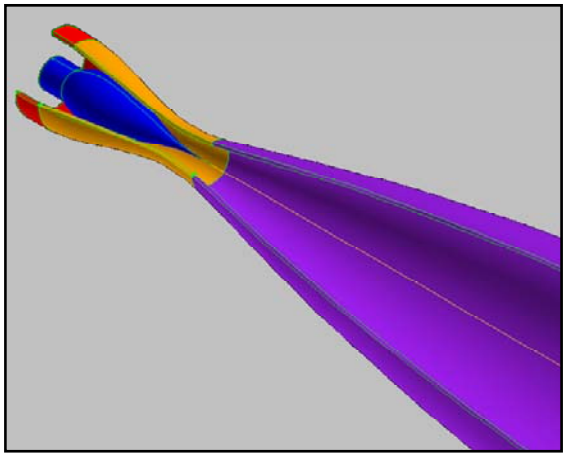
JMETC

- Established in FY2007
- Provides corporate infrastructure for distributed Joint testing
- 6.5 RDT&E funds
- ~$10M / year
- 8 current sites
  - Expanding to 26 sites
- Maintains
  - Network connections
  - Security agreements
  - Integration software
  - Interface definitions
  - Distributed test tools
  - Reuse repository

T&E/S&T Example of M&S Use: Ground Test Facility Design

- **Current Ground Test Conditions**
  - Fixed Mach number conditions
  - Fixed geometry that limit Mach number to a constant value
- **T&E Needs**
  - Simulate variable Mach number airflow
  - Create the transitional flow environment without introducing significant uncertainties





- **M&S Role**
  - Design nozzle shapes
  - Simulate flow conditions required for ground test
  - Verify nozzle design
  - Lower overall design cost

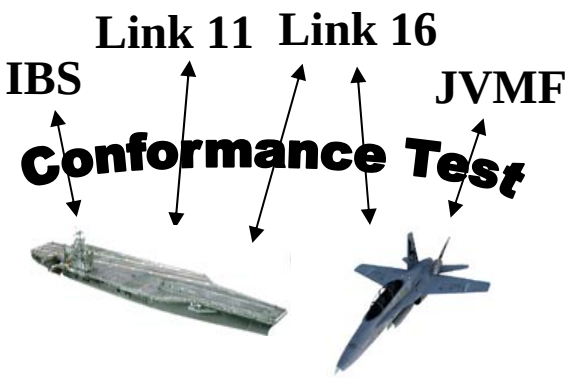
T&E/S&T Example of M&S Use: Multi-Spectral Scene Generation

- **Current Conditions**
  - Unable to generate realistic conditions for multi-spectral sensors and seekers testing
- **T&E Needs**
  - Multi-spectral scenes to enhance test data measurement
  - Simulation for hardware-in-the-loop testing

- **M&S Role**
  - Create realistic and dynamic multi-spectral scenes using computational technology
  - Portray full range battlespace or test environment phenomena
  - Verify sensor / seeker response and performance

Interoperability Testing Needs
Past, Present, and Future

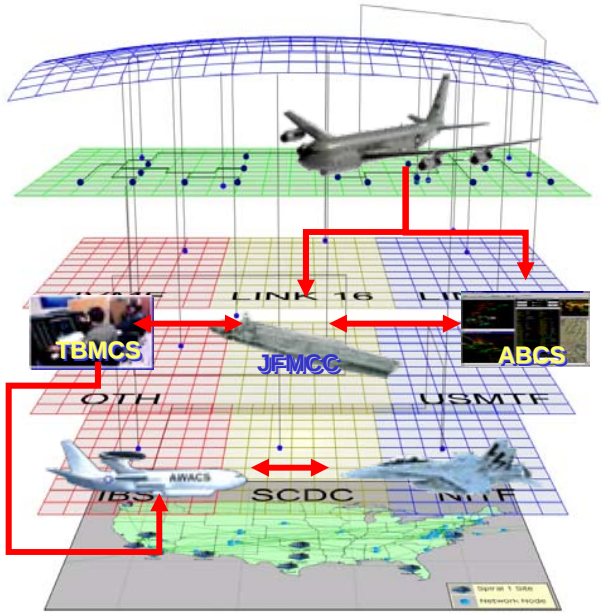
Yesterday's Solution



Platform Centric Tactics

Technical Interoperability

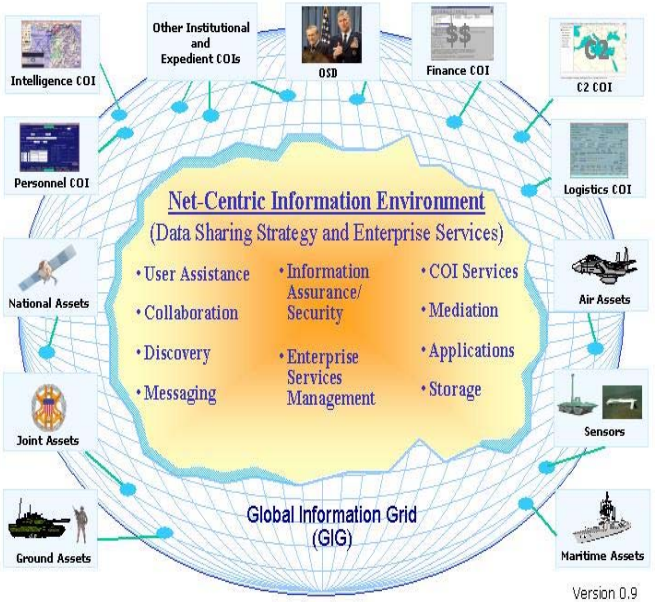
Today's Need



Joint Operations

System Interoperability

Future



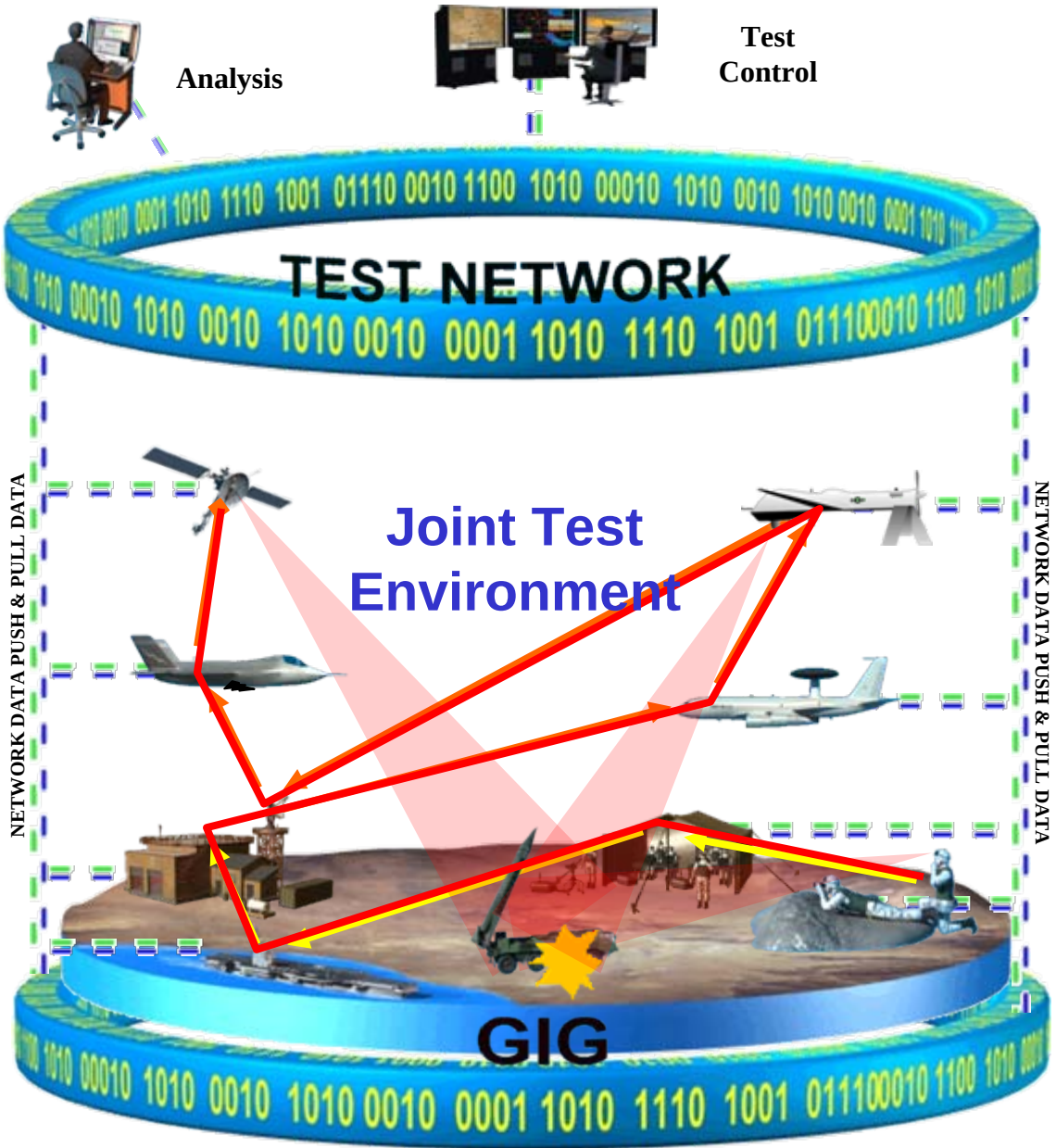
Network Centric Ops

Operational Interoperability

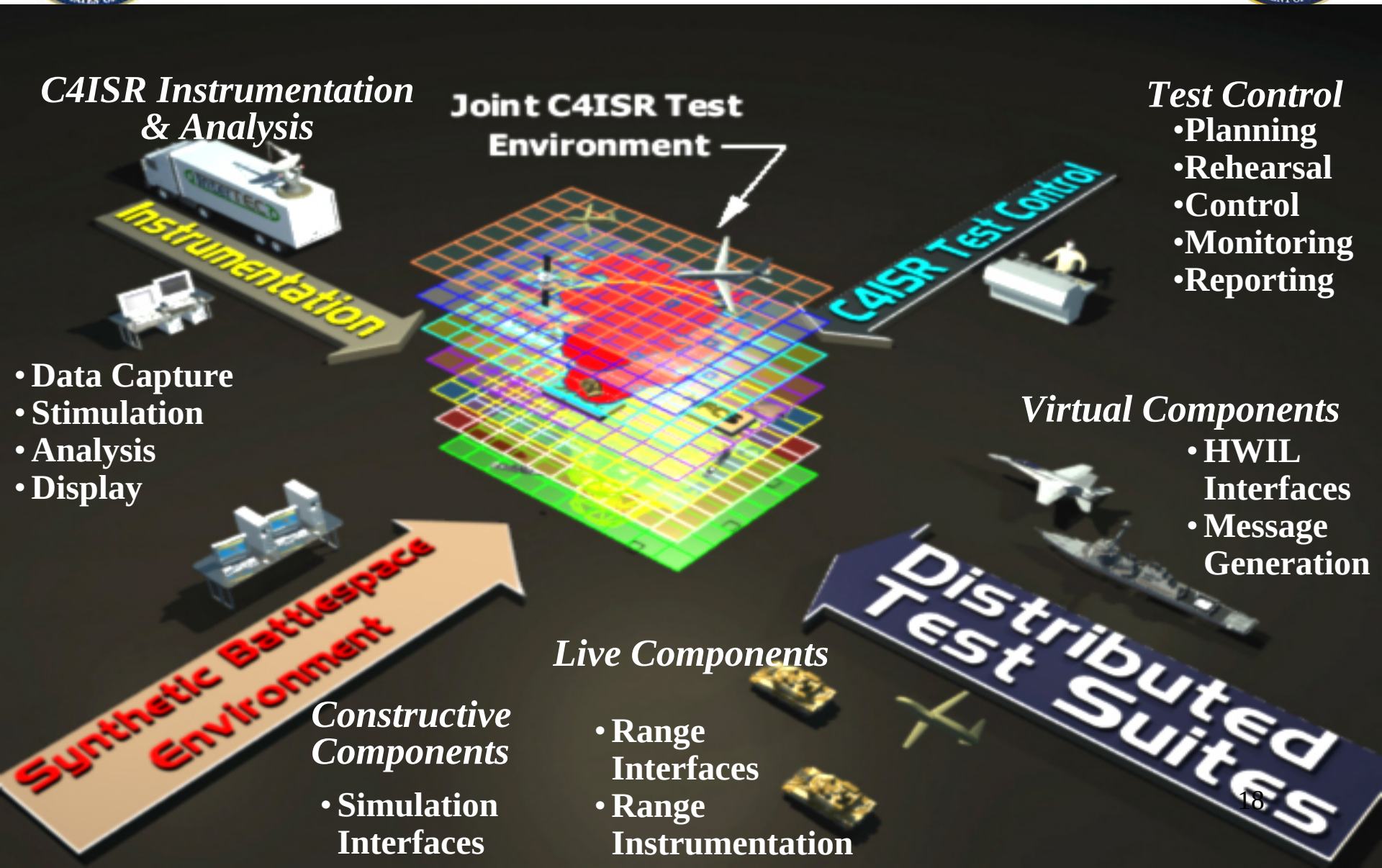
Key Metrics

- Certify Interoperability & Net Readiness in the Joint Battlespace
- End-to-End Networked Execution of Joint Mission Threads

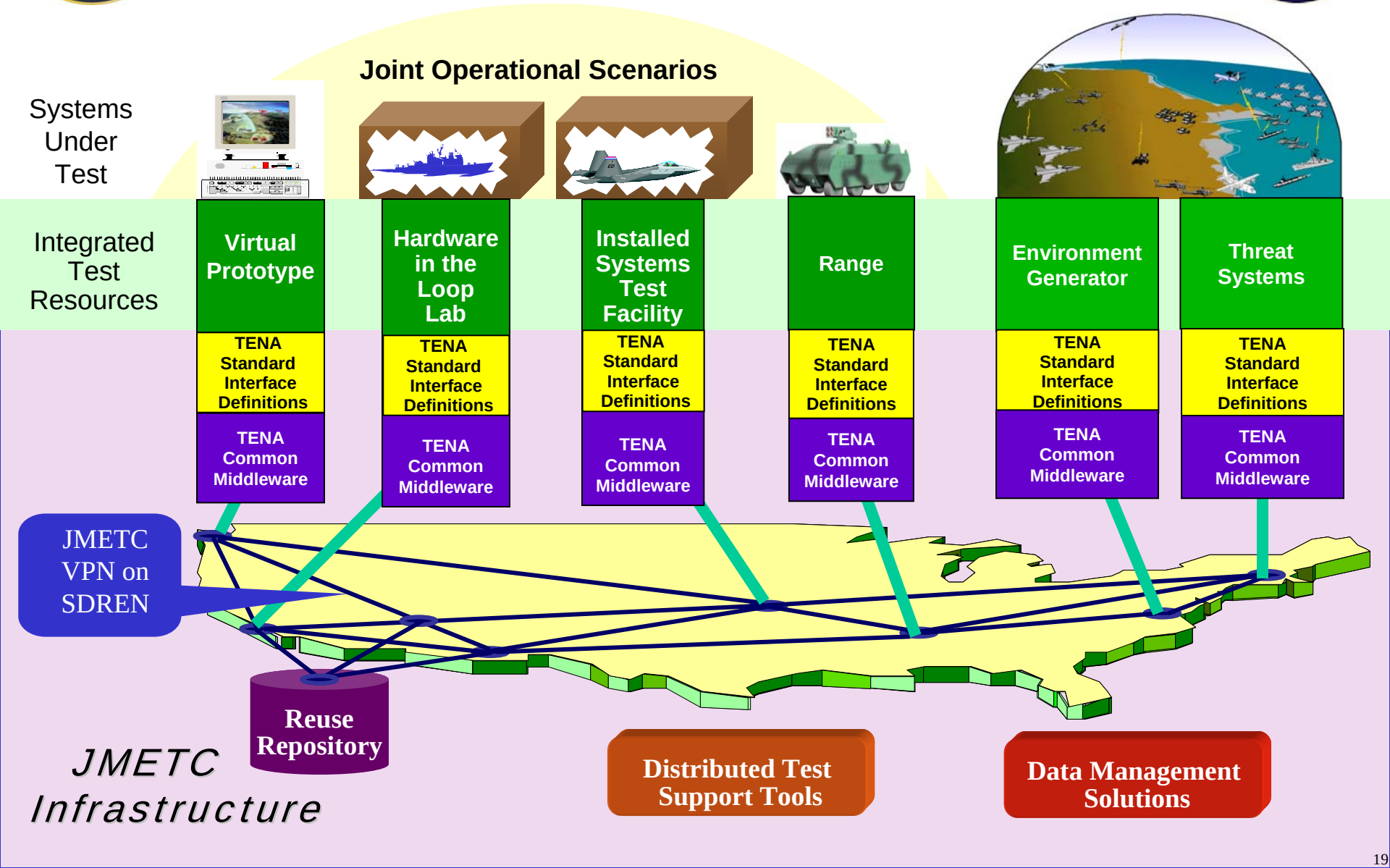
Testing in a Joint Environment



Interoperability Test & Evaluation Capability (InterTEC)

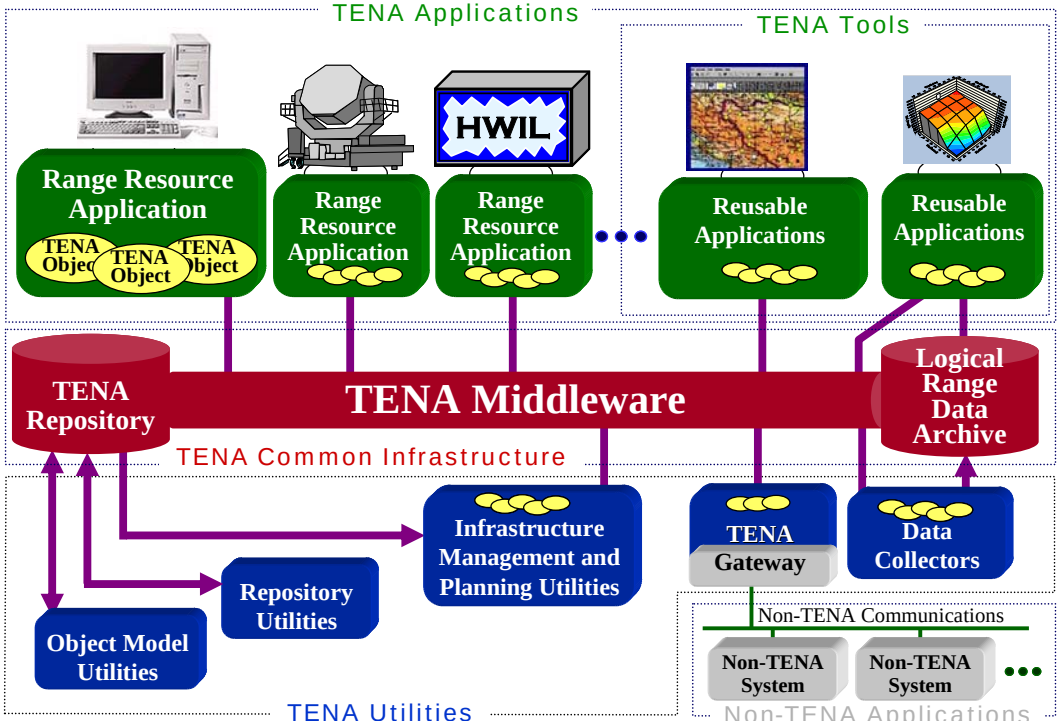


Joint Mission Environment Test Capability (JMETC)



Test & Training Enabling Architecture (TENA)

- Requirements
  - **Interoperability**
  - **Reuse**
  - **Composability**
  - Support Rapid Integration
  - Gradual Deployment
- Guiding Principles
  - Non-Proprietary
  - Provide middleware
  - Use real software objects
  - Maximize code generation
  - Management by users (AMT)
  - No license fee (GOTS)
- Supports
  - Testers & Trainers
  - Joint, Army, Navy, Air Force, Agencies
  - Live, Virtual, Constructive
  - Range, Laboratories, Simulations
  - Real-Time & Non-Real-Time



Summary

- We're always open to new ideas and new approaches to improve our current capabilities
- We're investing in new technologies
  - Look for the upcoming Broad Agency Announcement (BAA)
- We're investing in new capabilities
- We're sustaining a core integration capability
- **We want you to participate**
  - **Attend a JMETC Users Group meeting**
  - **Drop us an e-mail or give us a call**
    - **JMETC-feedback@jmetc.org**
    - **TENA-feedback@tena-sda.org**
    - **george.rumford@osd.mil**